

Application No.: 09/760,169
Filing Date: January 12, 2001
Page: 7

REMARKS

Claims 1 through 6, 8 through 11, 19 through 22 and new Claims 23 and 24 are pending in the application.

Claims 1 and 21 have been amended to reflect that in advantageous embodiments the inventive films are principally formed from crystallizable thermoplastic selected from the group consisting of polyethylene terephthalate and polybutylene terephthalate. Support for this amendment can be found in the Application-as-filed, for example on Page 5, fourth full paragraph in its entirety.

Claims 1, 19 and 20 have been amended to reflect that the inventive films advantageously comprise flame retardant consisting of one or more organic phosphorous compounds. Support for this amendment can be found in the Application-as-filed, for example on Page 9, third full paragraph, first sentence.

Claim 2 has been canceled, as its subject matter has been incorporated into Claim 1.

Claim 10 has been amended to positively recite the presence of phenolic stabilizer, as suggested by the Examiner.

Claim 11 has been canceled without prejudice or disclaimer to the filing of continuing applications thereon.

Claims 19, 20 and 21 have been amended to reflect that in advantageous embodiments the inventive films exhibit a longitudinal modulus of elasticity of greater than 3200 N/mm² after said film has been heat treated for 100 hours at 100 °C. Support for this amendment can be found in the Application-as-filed, for example on

Application No.: 09/760,169
Filing Date: January 12, 2001
Page: 8

Page 5, second full paragraph in its entirety in combination with Page 4, third full paragraph in its entirety.

Claims 23 and 24 have been added to complete the record for examination and highlight particularly advantageous embodiments of the invention.

Claim 23 is directed to advantageous inventive films having a thickness of from 5 to 50 μm . Support for this amendment can be found in the Application-as-filed, for example on Page 3, second full paragraph in its entirety and Page 22, fourth paragraph in its entirety.

Claim 24 is directed to advantageous inventive films that are mono-layered. Support for this amendment can be found in the Application-as-filed, for example on Page 13, first full paragraph in its entirety.

Reexamination and reconsideration of this application, withdrawal of all rejections, and formal notification of the allowability of the pending claims are earnestly solicited in light of the remarks which follow.

Rejection under 35 USC 112

Claims 1 through 6, 8 through 11, 19 and 20 stand rejected as failing to comply with the written description requirement over the recitation "said low flammability is imparted entirely by flame retardant consisting of one or more organic phosphorous compounds."

Applicants respectfully submit there is no requirement under United States practice of "in ipso verbis." The Application-as-filed clearly conveys to one skilled in the art that Applicants invented the claimed subject matter. Consequently, the Examiner has failed to provide a prima facie case of failure of written description.

Application No.: 09/760,169
Filing Date: January 12, 2001
Page: 9

However, solely to advance prosecution of the case, Claims 1, 19 and 20 have been amended to delete the term "low-flammability is provided entirely by." Claims 1, 19 and 20 have further been amended to instead recite that the "film comprises flame retardant consisting of one or more organic phosphorous compounds." Accordingly, Applicants respectfully request withdrawal of this rejection.

Claim 11 stands rejected as being indefinite for a variety of reasons. Claim 11 has been canceled without addressing the merits of the rejection and solely to advance prosecution of the case. Applicants respectfully reiterate that Claim 11 has been canceled without prejudice or disclaimer to the filing of continuing applications thereon. Accordingly, Applicants respectfully request withdrawal of this rejection.

Submission of Terminal Disclaimer

Various claim combinations stand (either provisionally or actually) rejected on the ground of non-statutory obviousness-type double patenting over the claims of co-pending Application Nos. 09/757,721; 09/781,628; 09/882,596; 10/084,028; 10/181,506 (U.S. Patent No. 6,794,432 B2); 10/181,509 (U.S. Patent No. 6,730,406 B2); 10/181,529 (U.S. Patent No. 6,875,803 B2); 10/181,752 (U.S. Patent No. 6,689,454 B2); 10/181,791 (U.S. Patent No. 6,872,461 B2); and 10/182,317 (U.S. Patent No. 6,709,731 B2).

Solely to advance prosecution of the case and without addressing the merits of the rejection, Applicants respectfully submit herewith a terminal disclaimer, as suggested by the Examiner. More particularly, Applicants submit herewith a terminal disclaimer that disclaims the terminal part of any patent granted on the above-identified application extending beyond the expiration date of the full statutory term which may ultimately result from patents issuing from the cited co-pending applications, i.e. Application Nos. 09/757,721; 09/781,628; 09/882,596; 10/084,028; 10/181,506; 10/181,509; 10/181,529; 10/181,752; 10/181,791; and 10/182,317.

Application No.: 09/760,169
Filing Date: January 12, 2001
Page: 10

Accordingly, Applicants respectfully request withdrawal of the rejection in light of the foregoing co-pending applications.

Obviation of Remaining
Double Patenting Rejections

Various claim combinations also stand provisionally rejected on the ground of non-statutory obviousness-type double patenting over the claims of co-pending Application Nos. 09/767,057; 10/181,505 and 10/182,538.

Co-pending Application No. 09/767,057 has a filing date of January 22, 2001; co-pending Application No. 10/181,505 has a filing date of July 18, 2002; and co-pending Application No. 10/182,538 has a filing date of July 26, 2002, each of which is subsequent to the United States filing date of the above-referenced application. As explained in the remarks below, all other remaining rejections should be overcome, thus leaving this provisional rejection as the only rejection pending in this application. Following the guidelines of MPEP § 804(I)(B), Applicants respectfully request that the Examiner withdraw the provisional double patenting rejection in this case and permit Applicants to address the issue of double patenting in the later-filed remaining co-pending Application Nos. 09/767,057; 10/181,505; and 10/182,538.

The Claimed Invention is Patentable
in Light of the Art of Record

Claims 1 through 6, 8 and 9 stand rejected over United States Patent No. 4,824,723 to Campbell et al. (US 723) in view of United States Patent No. 5,955,181 to Pelffer et al. (US 181) and German Patent Application DE 19630599 A1 to Murschall et al (DE 599) and further in view of United States Patent No. 5,919,536 to Bennett et al.

Application No.: 09/760,169
Filing Date: January 12, 2001
Page: 11

(US 536) and as evidenced by United States Patent No. 5,936,048 to Olshi et al. (US 048).

Claim 10 stands rejected over US 723 in view of US 181, DE 599, US 536 and US 048 as applied above, and further in view of United States Patent No. 5,716,570 to Peiffer et al. (US 570).

Claims 19 and 20 stand rejected over US 723 in view of US 181 and DE 599.

Claim 21 stands rejected over US 723 in view of United States Patent No. 5,804,626 to Rogers et al. (US 626) and US 181.

Claim 22 stands rejected over US 723 in view of US 181 and US 626 as applied above, and further in view of US 570.

It may be useful to briefly consider the invention before addressing the merits of the rejection.

There remains a need in the art for low-flammability, UV-resistant transparent films having improved physical properties at elevated temperatures.

Conventional low-flammability films are known. Unfortunately, conventional low-flammability polyester films are known to embrittle at high temperatures over a relatively short time period, making the film unusable. This embrittlement arises after as little as 48 hours at elevated temperatures. (The Examiner's attention is kindly directed to the Application-as-filed on Page 2, sixth paragraph through Page 3, first paragraph).

Altogether unexpectedly, Applicants have found that the onset of embrittlement within low-flammability polyester films can be greatly delayed by processing the flame retardant prior to its incorporation within the film. In particular, Applicants have found

Application No.: 09/760,169
Filing Date: January 12, 2001
Page: 12

that pre-drying or pre-crystallizing masterbatched flame retardant delays the onset of elevated temperature embrittlement within the resulting films. For example, films in accordance with the invention do not embrittle, i.e. they retain satisfactory mechanical properties, after 100 hours of heat treatment at 100 °C, as recited within the claims. The Application-as-filed emphasizes the unique physical benefits provided by the inventive films by noting the lack of elevated temperature embrittlement repeatedly, such as on Page 3, second paragraph; Page 10, third paragraph and Page 15, fourth paragraph. As noted above, conventional low-flammability films become brittle after as little as 48 hours at elevated temperatures.

Accordingly, the claims recite transparent, low-flammability, UV-resistant, biaxially oriented film having a thickness of from 5 to 300 µm, in which the film comprises crystallizable thermoplastic; at least one UV stabilizer; and at least one flame retardant. The crystallizable thermoplastic is advantageously selected from the group consisting of polyethylene terephthalate or polybutylene terephthalate. The flame retardant beneficially consists of one or more organic phosphorous compounds.

Quite unexpectedly, the inventive low-flammability films retain a modulus of elasticity of greater than 3200 N/mm² after 100 hours of heat treatment at 100 °C.

Applicants respectfully submit that the art of record does not teach or suggest the claimed transparent, UV-resistant, low-flammability films retaining their superior mechanical properties at elevated temperatures for extended periods of time.

US 723 is directed to thermoformable shielding materials having a flame retardant core layer and electrically insulating outer layers. The multi-layered materials are bonded to the exterior of components within electronic devices. (Col. 2, lines 7 – 9). The materials of US 723 range in thickness from at least 4 mils up to 240 mils (from over 100 to over 6000 µm). (Col. 5, lines 51 – 53)

Application No.: 09/760,169
Filing Date: January 12, 2001
Page: 13

US 723 provides a laundry list of suitable polymers for its core layer, including polyolefins and poly(aryl ethers). (Col. 2, lines 35 – 45). US 723 expressly notes that the method of preparing the components for the core layer “is not critical.” US 723 then goes on to disclose that dry blends of the core layer component may “simply be compounded.” (Col. 5, lines 60 – 65). US 723 evidences the state of convention wisdom regarding the detrimental effect of flame retardants on polymeric materials, noting that “the absence of flame retardant additives in the outer layers results in the maintenance of excellent physical properties.” (Col. 11, lines 26 – 30).

US 723, expressly noting that the method of preparing the core layer is “not critical,” does not teach or suggest manufacturing processes which would result in the recited low-flammability films retaining a modulus of elasticity of greater than 3200 N/mm² after 100 hours of heat treatment at 100 °C. US 723 instead evidences the conventional incorporation of flame retardant with resultant property loss with its disclosure that flame retardants have a detrimental impact on the resulting physical properties.

US 723, disclosing 6000 µm thick shielding materials, further does not teach or suggest such films having a thickness of from 5 to 50 µm, as recited in Claim 23.

And US 723, requiring electrically insulating outer layer(s), most certainly does not teach or suggest such films having a mono-layered configuration, as recited in Claim 24.

US 181 does not cure the deficiencies in US 723.

US 181 is directed to heat-sealable packaging films having a reduced tendency to stick during production and further processing. (Col. 1, lines 18 through 24 and Col. 2, lines 50 - 56). US 181 discloses the incorporation of ethylene 2,6-naphthalate (“EN”) into the heat-seal layer of packaging films to

Application No.: 09/760,169
Filing Date: January 12, 2001
Page: 14

improve the sticking properties of the resulting films. (Col. 3, lines 29 – 32 and lines 45 – 50 and Col. 5, lines 11 - 13). US 181 thus requires the presence of up to 95 wt % EN within its films. (Col. 5, lines 10 – 17). US 181 generically notes that any of the film layers may further contain “conventional additives.” In addition to heat sealability, US 181 further notes that its films may be easily embossed, i.e. the films of US 181 readily soften, upon exposure to temperatures above 90 °C. (Col. 8, lines 39 - 42).

US 181, requiring the presence of EN, does not teach or suggest the advantageous inventive films of the invention, formed from crystallizable thermoplastic selected from polyethylene terephthalate or polybutylene terephthalate.

Applicants respectfully submit that US 181, considered in its entirety, instead strongly teaches away from such films by requiring the incorporation of EN within its films. In fact, to modify US 181 so as to avoid the inclusion of EN would clearly render the resulting films unfit for their intended purpose. MPEP 2143.01 (citing *In re Gordon*, 221 USPQ 1125 (Fed. Clr. 1984)).

US 181 further does not teach or suggest the recited low-flammability films, much less manufacturing methods that would result in the recited low-flammability films retaining a modulus of elasticity of greater than 3200 N/mm² after 100 hours of heat treatment at 100 °C. US 181 instead indicates that its films readily soften at such elevated temperatures.

DE 599 does not cure the deficiencies in US 723 and US 181.

DE 599 discloses the incorporation of UV stabilizer and one or more antioxidants into cast sheet to avoid yellowing in outdoor applications. Applicants respectfully submit that DE 599 is directed to polyethylene terephthalate cast sheet. The cast sheet ranges in total thickness from about 0.8 to 20 millimeter. The working examples of DE

Application No.: 09/760,169
Filing Date: January 12, 2001
Page: 15

599 have a thickness of 4 millimeter. Example 4 indicates that the UV stabilizer may be incorporated as a masterbatch. DE 599 does not indicate that the masterbatch has been pre-processed in any way, however.

Applicants respectfully submit that DE 599 does not teach or suggest the recited biaxially oriented film.

DE 599 thus most certainly does not teach or suggest manufacturing methods which would result in the recited low-flammability biaxially oriented films retaining a longitudinal modulus of elasticity of greater than 3200 N/mm² following heat treatment.

And DE 599, directed to up to 20 millimeter cast sheet, can not teach or suggest such films having a thickness of from 5 to 50 μ m, as recited in Claim 23.

Applicants thus respectfully submit that the claimed invention is patentable in light of DE 599, considered either alone or in combination with the art of record.

US 536 likewise falls to address the foregoing deficiencies.

US 536 is generally directed to magnetic tape and capacitor films incorporating polyethylene naphthalate bibenzoate (PENBB). (Col. 1, lines 10 – 32). US 536 more particularly determined a beneficial monomer mixture that avoided the expected pre-crystallization of PENBB. (Col. 2, lines 5 – 32 and Col. 3, lines 15 – 54). US 536 generically notes that its films may further contain additives, such as processing auxiliaries and the like. (Col. 6, lines 53 – 58). US 536 goes on to provide a number of laundry lists of various additives. (Col. 6, line 60 – Col. 7, line 36). US 536 is altogether silent as to flame retardants, however.

The PENBB films of US 536 are purportedly more rigid and heat resistant than conventional polyester films. (Col. 2, lines 54 – 55). The heat resistance noted for US

Application No.: 09/760,169
Filing Date: January 12, 2001
Page: 16

536 refers to the elevated melting point and glass transition temperature imparted by the PENBB. (Col. 13, lines 5 – 10). US 536 does not disclose that it is flame retardant.

US 536 provides several modulus values for its films. US 536 merely provides modulus values for its films as-produced and after a 10 minute heat treatment; however. (Col. 14, line 60 – Col. 15, line 55). US 536 is altogether silent as to the modulus of films subjected to elevated temperatures for more extended periods of time, such as the recited 100 hours.

Applicants respectfully submit that US 536 does not teach or suggest the claimed invention. US 536, requiring PENBB films, does not teach or suggest the recited films formed from polyethylene terephthalate or polybutylene terephthalate.

Nor does US 536 teach or suggest the recited flame retardants or UV stabilizers.

And US 536, failing to teach or suggest flame retardants, thus can not teach or suggest methods by which to produce the recited flame retardant films exhibiting a modulus of elasticity above about 3200 N/mm² longitudinally after 100 hours of heat treatment at 100 °C. As noted above, US 536 merely indicates the properties of its PENBB films after 10 minutes of elevated temperature and further does not disclose flame retardants.

Consequently, Applicants respectfully submit that US 536 does not teach or suggest the claimed invention, considered either alone or in combination with the art of record.

US 048 similarly fails to teach or suggest the claimed invention.

Application No.: 09/760,169
Filing Date: January 12, 2001
Page: 17

US 048 is directed to resins intended for use as durable items, electrical materials and the like. (Col. 1, lines 20 – 26). Exemplary articles formed from the resins of US 048 include bathtubs, toilets and car bumpers. (Col. 20, lines 31 – 38). In fact, US 048 provides a laundry list of suitable applications. (Col. 20, lines 38 – 56). Films are noticeably absent from the list, however.

US 048 is directed to methods for bonding norbornenyl-based flame retardants to polymer resins. (Col. 4, lines 40 – 45; Col. 7, lines 60 – 66 and Col. 9, line 66 – Col. 10, line 3 and Col. 9, lines 37 – 49). US 048 expressly describes its modified resins as “quite different” from “known” compounds. (Col. 2, lines 49 – 50). The modified resins may further be reacted with an epoxide to impart additional properties. (Col. 3, lines 15 – 20). Applicants respectfully submit that the primary purpose of such epoxide modified resin is nevertheless flame retardance, and hence it (and the base norbornenyl-modified resin) would clearly be excluded from the claimed invention.

Furthermore, Applicants respectfully submit that, considered in its entirety, US 048 discourages the use of phosphorous-containing compounds alone. In particular, US 048 expressly notes that the flame retardance provided by phosphorus containing compounds is “insufficient” if the compounds are used alone. (Col. 3, lines 49 – 50). US 048 goes on to state that “known” flame retarding methods, i.e. methods that do not incorporate its norbornenyl-modified resins, are “insufficient and impractical.” (Col. 4, lines 31 – 32). Hence US 048 clearly indicates that articles including conventional flame retardants would not provide sufficient levels of flame retardancy. Further, the examples within Table 3 include a mixture of flame retardants, including US 048’s particular norbornenyl-based flame retardant resin. (Col. 52, lines 49 – 51 and Col. 38, lines 45 – 50).

Applicants respectfully submit that US 048 does not teach or suggest the recited biaxially oriented low-flammability films, and particularly not such films whose low-flammability properties are imparted entirely by flame retardants consisting of one or

Application No.: 09/760,169
Filing Date: January 12, 2001
Page: 18

more organic phosphorous compounds. In fact, US 048, considered in its entirety, strongly teaches away from such films. Furthermore, to modify US 048 so as to avoid the inclusion of its norbornenyl-modified flame retardant resin would clearly render the resulting articles unfit for their intended purpose. MPEP 2143.01 (citing *In re Gordon*, 221 USPQ 1125 (Fed. Clr. 1984)).

Nor does US 048 teach or suggest manufacturing processes that would result in the recited low-flammability film retaining a longitudinal modulus of elasticity of greater than 3200 N/mm² following heat treatment.

Applicants thus respectfully submit that the claimed invention is patentable in light of US 048, considered either alone or in combination with the art of record.

Applicants respectfully submit that there would have been no motivation to have combined these references. Applicants respectfully submit that merely because the references can be combined is not enough, there must still be a suggestion. MPEP 2143.01 (section citing Mills).

US 723 is directed to shielding materials having electrically insulating outer layers. US 181 is directed to heat sealable films incorporating EN for improved runnability. DE 699 is directed to cast sheet having improved yellowness. US 536 is directed to magnetic tape and capacitor films incorporating polyethylene naphthalate bibenzoate (PENBB). US 048 is directed to flame retardant norbornenyl-modified resins for durable goods. These are altogether different fields of endeavor and problems solved, to say the least.

Applicants respectfully submit that the Office Action is instead indulging in impermissible hindsight by merely picking and choosing elements from the prior art.

Application No.: 09/760,169
Filing Date: January 12, 2001
Page: 19

Nevertheless, even if the foregoing references were combined (which Applicants submit should not be done), the claimed invention would not have resulted. In particular, the combination of references would not result in the recited biaxially oriented films which include flame retardants consisting of one or more organic phosphorous compounds, and most certainly not such films formed from thermoplastic consisting of polyethylene terephthalate or polybutylene terephthalate that further retain a longitudinal modulus of elasticity of greater than 3200 N/mm² after heat treatment.

Accordingly, Applicants respectfully submit that Claims 1 through 6, 8, 9, 23 and 24 are patentable in light of US 723, US 181, DE 599, US 536 and US 048, considered either alone or in combination.

Claim 10 is likewise patentable over US 723 in view of US 181, DE 599 and US 536 and US 048 as applied above, and further in view of US 570.

US 723, US 181, DE 599, US 536 and US 048, considered either alone or in combination, fail to teach or suggest the claimed invention, as described above.

US 570 does not cure the deficiencies within the foregoing references.

US 570 is directed to polypropylene films, such as used in packaging. (Col. 1, lines 5 – 10). The blaxial orientation process inherently results in the production of a scrap portion, referred to in the art as "edge trim." The recycling of polypropylene edge trim is problematic in certain applications. (Col. 1, lines 17 – 47). US 570 reduces the economic losses incurred in conventional polypropylene film production by employing two polypropylene polymers, A and B, of differing purity. (Col. 2, lines 38 – 47). US 570 directs the lower grade polymer to the outermost edges of the film, where it ultimately becomes scrap material, while the higher quality polypropylene (forming the remainder of the web) is retained. As correctly noted by the Examiner, US 570 does

Application No.: 09/760,169
Filing Date: January 12, 2001
Page: 20

note that its films may contain stabilizers. (Col. 3, line 17 – 32 and Col. 4, lines 59 – 62). US 570 is altogether silent as to the presence of flame retardants, however.

US 570, directed to polypropylene films, does not teach or suggest the recited films formed from crystallizable thermoplastic selected from the group consisting of polyethylene terephthalate or polybutylene terephthalate.

US 570, failing to teach or suggest the claimed flame retardants, further can not teach or suggest the recited flame retardants consisting of one or more organic phosphorous compounds.

Thus US 570 most certainly can not teach or suggest manufacturing processes resulting in the recited low-flammability films exhibiting a modulus of elasticity above about 3200 N/mm² longitudinally after 100 hours of heat treatment at 100 °C.

Nevertheless, even if the foregoing references were combined (which Applicants submit should not be done), the claimed invention would not have resulted. In particular, the combination of references would not result in the recited biaxially oriented films whose low-flammability is imparted entirely by flame retardants consisting of one or more organic phosphorous compounds, and most certainly not such films formed from thermoplastic consisting of polyethylene terephthalate or polybutylene terephthalate that retain a longitudinal modulus of elasticity of greater than 3200 N/mm² after heat treatment.

Consequently, Claim 10 is patentable over US 723, US 181, DE 599, US 536, US 048 and US 570, considered either alone or in combination.

Application No.: 09/760,169
Filing Date: January 12, 2001
Page: 21

Claims 19 and 20 are likewise patentable over US 723 in view of US 181 and DE 599.

As noted above, each of the cited references fails to teach or suggest manufacturing methods that would result in low-flammability films retaining a modulus of elasticity of greater than 3200 N/mm² after 100 hours of heat treatment at 100 °C.

Claim 21 is patentable over US 723 in view of US 626 and US 181.

US 626 is generally directed to Improved polyethylene naphthalate monofilament for paper machine cloth. (Col. 7, lines 43 – 54). US 626 is more particularly directed to polyethylene naphthalate compositions having improved hydrolytic stability that are used to form such monofilament. (Col. 2, lines 53 – 56). In contrast to the recited flame retardant films, US 626 expressly notes that its compositions suffer from "reduced heat resistance." (Col. 7, lines 3 – 4).

US 626, primarily directed to monofilament, does not teach or suggest the recited biaxially oriented film or low-flammability films, much less such biaxially oriented low-flammability film manufactured to exhibit a modulus of elasticity above about 3200 N/mm² longitudinally after 100 hours of heat treatment at 100 °C.

US 626, requiring the presence of polyethylene naphthalate, further does not teach or suggest the recited films formed from thermoplastic consisting of polyethylene terephthalate or polybutylene terephthalate. US 626 instead teaches away from such films. Furthermore, to modify US 626 so as to avoid the inclusion of EN would clearly render the resulting articles unfit for their intended purpose.

Applicants respectfully reiterate that there would have been no motivation to have combined these references.

Application No.: 09/760,169
Filing Date: January 12, 2001
Page: 22

However even if combined (which Applicants submit should not be done), the recited low-flammability films retaining a modulus of elasticity of greater than 3200 N/mm² after 100 hours of heat treatment at 100 °C would not result. And such films formed from thermoplastic consisting of either polyethylene terephthalate or polybutylene terephthalate most certainly would not have resulted.

Accordingly, Applicants respectfully submit that Claim 21 is patentable in light of US 723, US 626 and US 181, considered either alone or in combination.

Claim 22 stands rejected over US 723 in view of US 181 and US 626 as applied above, and further in view of US 570.

As noted above, each of US 723, US 181, US 626 and US 570 do not teach or suggest the claimed invention.

Applicants further respectfully note that there would have been no motivation to have combined these references, which are from altogether different fields of endeavor and solve vastly different problems.

However even if combined (which Applicants submit should not be done), the recited low-flammability films retaining a modulus of elasticity of greater than 3200 N/mm² after 100 hours of heat treatment at 100 °C would not result. And such films formed from thermoplastic consisting of either polyethylene terephthalate or polybutylene terephthalate most certainly would not result.

Accordingly, Applicants respectfully submit that Claim 22 is likewise patentable in light of US 723, US 626 and US 181 and US 570, considered either alone or in combination.

Application No.: 09/760,169
Filing Date: January 12, 2001
Page: 23

Based on the foregoing, Applicants respectfully submit that the claimed invention is patentable in light of the cited art, considered either alone or in combination.

CONCLUSION

It is respectfully submitted that Applicants have made a significant and important contribution to the art, which is neither disclosed nor suggested in the art. It is believed that all of pending Claims 1, 3 through 6, 8 through 10 and 19 through 24 are now in condition for immediate allowance. It is requested that the Examiner telephone the undersigned if any questions remain to expedite examination of this application.

It is not believed that extensions of time or fees are required, beyond those which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time and/or fees are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required is hereby authorized to be charged to Deposit Account No. 50-2193.

Respectfully submitted,

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CERTIFICATE OF FACSIMILE TRANSMISSION

I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office at facsimile number (571) 273-8300 on March 20, 2005. *Claire Wygand*

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